REMARKS

Claims 1-6, 8-12 are now pending in the application. Claims 11-12 are new. Support for the foregoing amendments can be found throughout the specification, drawings, and claims as originally filed. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

REJECTION UNDER 35 U.S.C. § 103

Claims 1-10 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ciscon et al. (U.S. Pub. No. 2002/0004827) in view of Srivastava (U.S. Pat. No. 6,684,331). This rejection is respectfully traversed.

The Examiner asserts that the feature "management at an interface layer for controlling multicasting characteristics corresponding to interfaces" in claim 1 is disclosed by Ciscon (e.g., abstract and para. [0014]). Applicant respectfully traverses the Examiner's assertion.

The abstract and para. [0014] of Ciscon at best disclose a multi-layered network, a network monitor and a network controller. The multi-layered network has a plurality of OSI reference model layers functioning therein. The network monitor monitors at least one OSI reference model layer functioning, determines that a QoS event has occurred in the multi-layered network, and determines that the QoS event occurred at a layer N in the OSI reference model. The network controller responds to the QoS event in the multi-layered network by changing the network provisioning at a layer less than N.

Applicant respectfully submits that Ciscon does not teach or suggest the above features for at least the following reasons:

The concept of OSI reference model layers in Ciscon is a standard model of network data communication, and the method provided by Ciscon relates to data communication in a multi-layered network, which is applied to a network and needs to configure specific devices, such as the network monitor and network controller, to manage the QoS event occurred in OSI reference layers of the network. In contrast, the interface layer in claim 1 is a level of multicasting management configuration in an entity having multicasting function, such as an edge service router (see para [0016] as originally filed). In other words, the "interface layer" of claim 1 represents the management at a level of multicasting interface. Therefore, the OSI reference layers differ from the interface layer of the claim 1.

Ciscon at best discloses that the network monitor monitors and determines that a QoS event has occurred in the multi-layered network and the network controller responds to the QoS event in the multi-layered network. Therefore, Ciscon is directed to a QoS event monitor and controller that secures the reliability of data communication of the network. In contrast, claim 1 is directed to management at an interface level for controlling multicasting characteristics corresponding to interfaces; the management at interface level is directed to management of multicasting characteristics corresponding to multicasting interfaces. Thus, the objects of management in Ciscon and claim 1 differ, which leads to different implementation.

Further, the Examiner asserts that the features of "management at data link layer for controlling multicasting characteristics corresponding to data links, management at user layer for controlling multicasting characteristics corresponding to particular users" in claim 1 are anticipated by Ciscon (e.g., abstract, and figure 1). Applicant respectfully

traverses the Examiner's assertion

Figure 1 of Ciscon discloses an application data flow path through functional layers of a communication system. The basis of the functional layers is the OSI model. In this model, information may be communicated between first and second users by traversing through the functional layers.

Applicant respectfully submits that Ciscon does not teach or suggest the above features for at least the following reasons:

The concept of OSI reference model layers in Ciscon is a standard model of network data communication, and the method provided by Ciscon relates to data communication in a multi-layered network, which is applied to a network and needs to configure specific devices, such as the network monitor and network controller, to manage the QoS event occurred in OSI reference layers of the network. In contrast, the data link layer and user layer in claim 1 are levels of multicasting management configuration in an entity having multicasting function, such as an access server or edge service router. In other words, the "data link layer" and "user layer" represent the management at a level of data link and the management at a level of user respectively.

Ciscon is at best directed to QoS event monitor and controller that secure the reliability of data communication of the network. In contrast, claim 1 is directed to management at data link layer for controlling multicasting characteristics corresponding to data links and management at user layer for controller multicasting characteristics corresponding to users. The management at data link level is directed to management to multicasting characteristics corresponding to data links and the management at user link level relates to management to multicasting characteristics corresponding to users. The objects of management in Ciscon and claim 1 differ, which leads to different

implementation.

Figure 1 of Ciscon at best discloses a point-to-point data communication through the standardized ISO-OSI layers, and the data is communicated between two users through traversing through the OSI layers. Ciscon at best appears to disclose a point-to-point QoS controlling scheme. In contrast, claim 1 is directed to multicasting characteristics management at different levels, i.e., a point-to-multipoint multicasting controlling scheme. The point-to-point QoS controlling scheme disclosed by Ciscon can not teach or suggest a point-to-multipoint multicasting controlling scheme.

Further, the Examiner asserts that the features of "at each layer, setting control blocks that are respectively comprised of multicasting characteristic data corresponding to said each layer" in claim 1 is anticipated by Ciscon (e.g., abstract and para. [0003], para. [0013] and para. [0014]). Applicant respectfully traverses the Examiner's assertion.

Ciscon at best appears to disclose a multi-layered communication system that is implemented with a broadband communications platform that enables quality of application service delivery and user control over the priority of information delivery flow.

Applicant respectfully submits that Ciscon does not teach or suggest the above features for at least the following reasons:

The control blocks of the layers in claim 1 comprise multicasting characteristic data corresponding to each layer respectively. In contrast, neither the network monitor nor the network controller which are both adapted for QoS controlling of Ciscon has multicasting characteristic data.

Ciscon discloses that a network monitor and a network controller are adapted for monitoring and controlling QoS of all the OSI reference model layers. In contrast, in

claim 1, each of the interface level, data link level and user level has a control block which has multicasting characteristic data corresponding to each layer.

Further, the Examiner asserts that the features of "establishing a data relationship among the three layers of control blocks" is disclosed by Ciscon (e.g., par [0073] and figure 4). Applicant respectfully traverses the Examiner's assertion.

Cisco at best appears to disclose a network controller that responds the QoS event in a network element. Specifically, a resource database, interworking with the network controller and the network monitor, organizes communication resources of the network element according to where the communication resources fit in the OSI reference model, and additionally, the resource database maintains the relationship between the various layers in the OSI model for the communication resources.

Applicant respectfully submits that Ciscon does not teach or suggest the above features for at least the following reasons:

The resource database disclosed by Ciscon stores and maintains the relationship of communication resources among various layers in OSI model. For example, the communication resources include communication links. In claim 1, however, control blocks stores the multicasting characteristic data. The relationship of communication resources in Ciscon and the multicasting characteristic data in claim 1 differ. The relationship of communication resources is used for QoS controlling in data communication, while the multicasting characteristic data is used for multicasting controlling.

Further, the Examiner asserts that the features of "managing a user of the multicasting group using the data relationship among the three layers of control blocks" is disclosed by Ciscon (e.g., abstract, figure 3 and figure 4). Applicant respectfully

traverses the Examiner's assertion.

Figure 3 of Ciscon at best discloses connections among the network monitors, the network controllers, the resource database and the network element. Figure 4 of Ciscon at best appears to disclose a method for providing broadband communication over a multi-layered network, including: monitoring at least one OSI reference model layer functioning; determining that a QoS event occurred in the multi-layered network; determining the QoS event occurred at layer N; responding the QoS event by changing the network provisioning at a layer less than N, and signaling that the network provisioning has been updated at a layer less than N.

Applicant respectfully submits that Ciscon does not teach or suggest the above features for at least the following reasons:

As presented above, the control blocks for the three levels in claim 1 have the multicasting characteristic data. The relationship among the control blocks are among the multicasting characteristic data of the three levels. The relationship among the multicasting characteristic data of the three levels is used for controlling activities of users of multicast groups, such as joining a group or leaving a group. In contrast, Ciscon at best appears to disclose controlling QoS by using the relationship of communication resources among various layers in OSI model. Ciscon fails to teach or suggest controlling users of multicasting groups by using the relationship of multicasting characteristic data among the three levels.

The Examiner acknowledges that Ciscon does not disclose the management system including the multicasting proxy. The Examiner, however, asserts that Srivastava discloses multicasting proxy (e.g., abstract, col. 5, lines 1-10, multicast proxy service node). Applicant respectfully traverses the Examiner's assertion.

Srivastava at best appears directed to a method for establishing secure communication among multiple multicast proxy service nodes of domains. The domains are organized in a logical tree and each domain stores a logical tree that organized the multicast proxy service nodes. Each domain also comprises a group manager at the root node of the binary tree, a multicast key distribution center, multicast service agent and directory service agent and key distribution center. The multicast proxy service node refers to multicast service agent, multicast KDC and/or group controller. A multicast group member joins or leaves a group by publishing a message. The local key distribution center and multicast service agent obtains the identity of the publisher and based on the ID value, and a secure channel is established with the DSA of the group member's domain. Srivastava at best appears directed to a multicast proxy service node which only stores a group session key and a private key.

In contrast, claim 1 is directed multicasting management performed in a multicasting proxy entity such as access server and edge service router, and the multicasting management is divided into three levels: interface level, data link level and user level. Although Srivastava may mention a multicast proxy service node, the multicast proxy service node only stores a group session key and a private key. Srivastava fails to teach or suggest configuring three levels of multicasting management in the multicast proxy service node.

Further, Applicant has amended claim 1 to include similar limitations of claim 7. Claim 7 is cancelled. In rejecting claim 7, the Examiner asserts that the limitations of managing the joining or leaving the multicasting group of the user is taught by

Srivastava, referring to col 7, lines 21-28. Applicant respectfully traverses the Examiner's assertion.

Srivastava at best appear to disclose that the session keys are generated based on a public key scheme and the commonality between the physical topology of domains and the structure of a binary tree is used for generate a network of group controllers which manages membership within a secure multicast or broadcast group.

Although Srivastava mentions that the commonality between the physical topology of domains and the structure of a binary tree is used for generate a network of group controllers which manages membership, it emphasizes on how to update the group session keys after users joint or leave the multicast group. In contrast, claim 1 is directed to a method that defines how to implement multi-level multicasting management.

In rejecting claim 7, the Examiner asserts that the limitations of "finding a certain interface layer control block according to data structure of an interface of net (IFNET) having received a multicasting packet" is taught by Ciscon, referring to para. [0056]. Applicant respectfully traverses the Examiner's assertion.

Ciscon at best appears directed to connections among the network monitors, the network controllers, the resource database and the network element. Ciscon at best appear to disclose that a flow of a method for providing broadband communication over a multi-layered network, including: monitoring at least one OSI reference model layer functioning; determining that a QoS event occurred in the multi-layered network; determining the QoS event occurred at layer N; responding the QoS event by changing

the network provisioning at a layer less than N, and signaling that the network provisioning has been updated at a layer less than N. Ciscon also discloses that the method would be equally applicable to any communication system having a plurality of OSI reference model functioning.

In claim 1, when the multicasting proxy receives a multicasting packet, it finds a control block of an interface level according to data structure of an IFNET since the data structure of an IFNET contains the information of the multicasting interface, and therefore, the control block for the interface can be determined. In contrast, Ciscon appears directed to a QoS controlling in a multi-layered network having multiple OSI reference model layers. The OSI layers in Ciscon differ from the multi-levels of multicasting managing.

In rejecting claim 7, the Examiner asserts that the limitations of "judging multicasting characteristics of the multicasting group which are defined in the found interface layer control block to determine whether to continue the successive processing; if so, performing the next steps, otherwise ending the processing" is taught by Ciscon, referring to para. [0072]. Applicant respectfully traverses the Examiner's assertion.

Ciscon at best gives an example of a QoS controls over a multi-layered network and how the network monitor monitors OSI reference model layer functioning to determine that a QoS event occurred at layer N.

In claim 1, after the multicasting proxy receives a multicasting packet and finds a control block of an interface level according to data structure of an IFNET, it determines

whether to continue the successive processing based on the multicasting characteristics of the multicasting group. Therefore, claim 1 is directed to access rights management of multicasting service. In contrast, Ciscon discloses how the network monitor monitors the QoS event and determines the layer N at which the event occurred. In other words, Ciscon is directed to QoS controlling, which differs from the access rights management of multicasting service provided by the claim 1 of the present invention.

In rejecting claim 7, the Examiner asserts that the limitations of "finding a certain data link layer control block according to the data relationship between data link layer control blocks and said interface layer control block" is taught by Ciscon, referring to para. [0037]. Applicant respectfully traverses the Examiner's assertion.

Ciscon at best gives an example of how to determine layers less than N. If layer 7 is considered layer N, the layers 3, 2 and 1 are layers less than N. If layer 3 is considered layer N, layers 2 and 1 are layers less than N.

In claim 1, after the multicasting proxy determines to continue the successive processing based on the multicasting characteristics of the multicasting group, it finds the data link layer control block according to the data relationship between data link layer control blocks and the interface layer control block. As stated above, Ciscon at best appear to disclose that all layers less than N is known as long as the layer N is determined, without any more determinations or judges. In contrast, because claim 1 is directed to multi-level multicasting management and there are relationships of the control blocks of the various levels, a control level of a next level is determined specifically based on the relationship between the control block of the current level and the control block of the next level.

In rejecting claim 7, the Examiner asserts that the limitations of "judging multicasting characteristics corresponding to data links of the multicasting packet to determine whether to continue the successive processing; if so, performing the next step, otherwise ending the processing" is taught by Ciscon, referring to para. [0072]. Applicant respectfully traverses the Examiner's assertion.

Ciscon at best gives an example of QoS controlling over a multi-layered network and how the network monitor monitors OSI reference model layer functioning to determine that a QoS event occurred at layer N.

In claim 1, after the multicasting proxy finds a data link layer control block, it determines whether to continue the successive processing based on multicasting characteristics corresponding to data links of the multicasting packet. Therefore, claim 1 is directed to access rights management of multicasting service. In contrast, Ciscon discloses how the network monitor monitors the QoS event and determines the layer N at which the event occurred. Thus Ciscon at best appears to directed to QoS controlling, which differs from the access rights management of multicasting service as defined in claim 1.

In rejecting claim 7, the Examiner asserts that the feature "finding a certain user layer control block according to a multicasting group IP and user attributes; then adding, deleting or modifying corresponding user information in the user layer control block" is taught by Ciscon, referring to para. 0039 and para. 0085.

Ciscon at best mentions that layer 3 may operate as a distributed IP layer, and Ciscon also give an example of how the network controller resolve a QoS event using

MPLS. If a QoS event is occurring at a network element, the network controller may use MPLS to route data traffic away from the problem causing network element.

In claim 1, after the multicasting proxy determines whether to continue the successive processing based on multicasting characteristics corresponding to data links of the multicasting packet, it finds the user layer control block according to the multicasting group IP address and user attributes, and then adding, deleting or modifying user information in the user layer control block. Therefore, the control block of user level is determined according to the multicasting group IP address and user attributes. As stated above, Ciscon gives an example of how the network controller resolve a QoS event using MPLS, which differs from the multicasting management at user level provided by the claim 1 of the present invention. Although Ciscon mentions that layer 3 may be operated as a distributed IP layer, Ciscon at best discloses that a dynamic routing scheme, which differs from the multicasting managing at user level of claim 1.

As stated above, Srivastava discloses a method for providing secure communication among multiple multicast proxy service nodes. Srivastava appears directed to a method that emphasizes on how to update the group session keys after users join or leave the multicast group. In contrast, claim 1 is directed to a method that defines how to implement multi-level multicasting management, i.e., interface level, data link level and user level, by using the relationship of multicasting characteristic data corresponding to multi-levels.

Therefore, Ciscon and Srivastava as relied upon by the Examiner fail to teach or suggest the claimed limitations.

In view of the forgoing, Applicant submits that claim 1 and its dependent claims 2-6 and 8-11 define over the art cited by the Examiner. Claim 12 define over the art cited by the Examiner for one or more of the reasons set forth regarding claim 1.

In addition, with respect ot claim 4, the Examiner asserts that the limitations of "said controlling multicasting characteristics corresponding to data links is forwarding only one multicasting packet for all members of the same multicasting group at the same data link when forwarding data" is taught by Ciscon, referring to para [0036] and para [0038]. Applicant respectfully traverses the Examiner's assertion.

Para. [0036] of Ciscon at best discloses that the data flow path is traversing some or all of OSI functional layers depending upon a variety of factors. Para [0038] of Ciscon at best discloses that layer 1 typically operates under control of a single computer that sends control signals to all devices in the layer.

In claim 4, because the multicasting proxy has the multicasting management at data link level and the multicasting characteristic data corresponding to data links is stored in the control block of the data link level, the multicasting proxy has the ability to forward only one multicasting packet for all members of the same multicasting group at the same data link, which can greatly save the network resources. Ciscon at best discloses that the layer 1 sends control signals to all devices in the layer, and fails to teach or suggest the multicasting forwarding scheme of forwarding only one multicasting packet for all members of the same multicasting group at the same data link.

Moreover, Ciscon relates to end-to-end data transfer, and Srivastava relates to

secured communication among multiple multicast proxy service nodes. Claim 4 is directed to multicasting management of data forwarding in a distributed network. Ciscon and Srivastava appear silent about these limitations.

Therefore, Ciscon and Srivastava as relied upon by the Examiner fail to teach or suggest the claim 4.

With respect to claim 10, the Examiner asserts that the limitations of "said managing a user of the multicasting group is performing flow charging control to the user of the multicasting group" is taught by Ciscon, referring to the abstract, figure 3). Applicant respectfully traverses the Examiner's assertion.

As stated above, the abstract of Ciscon at best discloses a multi-layered network, a network monitor and a network controller. The multi-layered network has a plurality of OSI reference model layers functioning therein. The network monitor monitors at least one OSI reference model layer functioning, determines that a QoS event has occurred in the multi-layered network, and determine that the QoS event occurred at a layer N in the OSI reference model. The network controller responds to the QoS event in the multi-layered network by changing the network provisioning at a layer less than N.

Figure 3 of Ciscon shows connections among the network monitors, the network controllers, the resource database and the network element.

Although Ciscon discloses a QoS controlling scheme over a network having multiple layers OSI reference model, Ciscon fails to teach any flow charge controlling to the user of the multicasting group. In contrast, claim 10 is directed to flow charging control to the user of the multicasting group.

The Examiner asserts that the limitations of "recording the flow of multicasting packets having been forwarded with a device forwarding program and charging the user who has received said multicasting packets" is taught by Ciscon, referring to para. [0030] and para. [0034].

Para. [0030] of Ciscon at best discloses that the layer 4 in the OSI reference model directs the processes for end-to-end transfer of information including error recovery and flow control, and par 0034 of Ciscon discloses that the communication resources may be categorized by where their functionality fits within the OSI reference model.

Although Ciscon discloses that the layer 4 directs the process for transfer including flow control, the flow control differs from the flow charging to the user of the multicasting group as defined in claim 10. Moreover, Ciscon fails to teach or suggest that the flow charging scheme of the as defined in claim 10, i.e., recording the flow of multicasting packets having been forwarded with a device forwarding program and charging the user who has received said multicasting packets.

Therefore, Ciscon and Srivastava as relied upon by the Examiner fail to teach or suggest the claim 10.

NEW CLAIMS

Claims 11-12 are new. Claim 11 defines the core edge layer network device of claim 3 as an Edge Service Router (ESR). Applicant submits that claim 11 defines over the art cited by the Examiner by virtue of its dependency on claim 1. Applicant further

submits that claim 12 defines over the art cited by the Examiner for one or more of the reasons set forth above regarding claim 1.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action and the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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